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Does the internet affect assortative mating? Evidence from the U.S. and Germany



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ABSTRACT

The Internet has now become a habitual channel for finding a partner, but little is known about the impact of this recent partnership market on mate selection patterns. This study revisits the supply side perspective on assortative mating by exploring the role played by online venues in breeding educational, racial/ethnic and religious endogamy. It compares couples that met online (through either online dating platforms, Internet social networking, Internet gaming website, Internet chat, Internet community, etc.) to those that met through various offline contexts of interaction. Using unique data from the U.S. for the year 2009 and data from Germany collected between 2008 and 2014, I run log-multiplicative models that allow for the strength of partners' association to vary along meeting settings. Results reveal that the Internet promotes weaker couple endogamy compared to conventional contexts typically known to foster endogamy, such as school, family, friends, or religious venues.

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1. Introduction

Mate selection and assortative mating (i.e., the nonrandom pairing of individuals with similar traits) depend on particular contexts of interaction (Bozon and Héran, 1989; Kalmijn and Flap, 2001; Lampard, 2007; Mollenhorst et al., 2008a). The pool of available partners supplied by certain social contexts and networks determines the extent to which individuals are able to match with people belonging to their own group. With significant parts of daily social life moving from offline to online venues, knowledge about the way in which the Internet as the most recent and increasingly prevalent setting of partner selection, influences assortative mating patterns compared to other contexts of interaction is increasingly needed.

The ongoing shifts in work and family life (e.g., rise in non-marital partnerships and non-standard family forms (Billari and Liefbroer, 2010; Elzinga and Liefbroer, 2007); a later age of entry into the first formal union (Manning et al., 2014; Sobotka and Toulemon, 2008); increased labor market and residential mobility (Caldera Sánchez et al., 2011)), and the decline of traditional settings of meeting and mating such as family or school (Rosenfeld and Thomas, 2012) mean that individuals become progressively more in charge with the process of finding a partner (Barraket and Henry-Waring, 2008). Against this backdrop, the Internet as noteworthy dating environment surged in popularity, fundamentally changing the dating landscape and the process of relationship initiation. According to U.S. survey data, by 2005 more than 20% of heterosexuals met their partner online (Rosenfeld and Thomas, 2012). Another survey-based study claims that between 2005 and 2012, more than one-third of U.S. marriages began via the Internet (Cacioppo et al., 2013). In

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Germany, online dating platforms (i.e., dating websites where people enroll with the specific purpose of finding a romantic partner) have witnessed a rapid surge, with approximately 5.4 million people seeking a partner online (Schulz et al., 2008). Attitudes towards the Internet as a suitable way to meet people and find a match have also grown more positive over time (Smith and Duggan, 2013). Despite the large interest it raises among scientists, media and general audiences alike (Sprecher, 2009), there is still limited understanding about the nature of relationships formed through the Internet as opposed to other partnership markets. Social relations initiated online are assumed to take on different forms than in traditional face-to-face settings, given that cyberspace provides distinct ways of communicating and interacting with others, non-mediated by typical third parties and unconstrained by physical boundaries (Houston et al., 2005; Merkle and Richardson, 2000). During the early stages of its development, the Internet was in fact the subject of optimistic predictions about its role in making ascriptive characteristics obsolete (Barlow, 1996; Castells, 2001). According to them, individuals' matching based on similar race or socio-economic status, known to prevail in segregated offline environments, would dissolve in the boundless space of the Internet. Skeptics, on the other hand, suggested that online dating¹ would reproduce existing patterns of assortative mating and that "the same type of people are meeting online as they do offline" (Henry-Waring and Barraket, 2008, p. 29). Studies examining partner preferences and first-stage contacting behavior in online dating platforms in both the U.S. and Europe have consistently revealed positive assortative mating in online partner selection, meaning a strong tendency to prefer or choose a partner that shares the same socio-economic, ethno-racial or religious background (e.g., Skopek et al., 2011; Lewis, 2013; Lin and Lundquist, 2013; Potarca and Mills, 2015; Robnett and Feliciano, 2011; Yancey, 2007, 2009). It remains unknown, however, whether the 'amount' of assortative mating decreases or increases in the context of digital dating markets compared to other places of meeting and mating. The question that guides this study is whether the online environment contributes to alleviating the typical social divides between groups by providing an unrestrictive space for partner selection, or whether it preserves social boundaries and even promotes more similarity between partners due to individuals' strong norm of endogamy and online opportunities for easily getting in contact with people from the same socio-demographic background.

This research aims to examine the extent to which online partnership markets foster couple endogamy in contrast to conventional offline settings of meeting by using recent survey data referring to how couples meet. To corroborate results across national contexts, the analysis relies on data sources originating from two Western countries where the Internet is a widely accepted and used channel for finding a partner, namely the U.S. and Germany (Cacioppo et al., 2013; Schulz et al., 2008). Based on the *How Couples Meet and Stay Together* survey in the U.S. and the *pairfam* and *DemoDiff* surveys in Germany, three of the most commonly studied types of endogamy, in connection to education, race/ethnicity, and religious background (Schwartz, 2013), are re-addressed. In this study, endogamy and related terms² are generically used to describe partnering within one's own group for both married and unmarried³ couples. Several types of meeting contexts are distinguished, including: the Internet (referring to online dating platforms, online communities, chat rooms, online social networks, online gaming etc.), family, friends, neighbors, leisure, the workplace, school, religious venues, or voluntary organizations.

The paper adds to the literature in several ways. First, it contributes to the recent line of studies examining the ways in which new technologies affect partner selection and romantic outcomes (e.g., Cacioppo et al., 2013; Rosenfeld and Thomas, 2012). More broadly, it seeks to expand the underdeveloped literature on where people seek for mates and the importance of the social milieu in which relationships are forged in breeding particular mate selection patterns (Schwartz, 2013). Second, it provides the first comprehensive comparison between couples that met via the Internet and couples that met via offline meeting venues with respect to endogamy patterns. Using the same U.S. data source, the research by Rosenfeld and Thomas (2012) offers novel insights into the differences between couples that met via the Internet and couples that met via family intermediaries. Nonetheless, the authors' examination does not extend beyond the Internet – family comparison and is also based on analyses that do not account for variation in the distribution of partners' characteristics. The current study improves upon these limitations by contrasting online settings to more than one offline setting, and by performing analyses that are more appropriate for the structure of the data, as described in the Methods section. Finally, the current research draws conclusions about endogamy patterns characterizing both U.S. and German couples. Relying on two data sources ensures a broad empirical reach and the opportunity to examine the cross-national generalizability of the link between digital partnership markets and couple endogamy. Despite differences in demographic and institutional factors that might impact the composition of general partnership markets in the two countries (e.g., a lower age at marriage in the U.S. (Soehl and Yahirun, 2011), a greater propensity and social legitimacy associated with non-marital cohabitation (Heuveline and Timberlake, 2004), and more generous family policies (Gangl and Ziefle, 2009) in Germany), previous studies identified the profile of Internet daters to be similar in both the U.S.

¹ Throughout this study, online/Internet dating refers to finding a partner in either one of the following online settings: online dating platforms, Internet social networking, Internet gaming website, Internet chat, Internet community etc. When solely referring to dating websites that provide a platform for their members to select and get in contact with potential partners, the expression 'online/Internet dating platforms' will be used.

² Whereas 'endogamy' is a typical term used to describe the choice of a partner belonging to the same (racial/ethnic or religious) group, 'homogamy' is a more common term when referring to matches between partners with a similar level of education (Schwartz, 2013). Nonetheless, the term 'homogamy' is only used when referring to previous studies of educational similarity between partners. Elsewhere, the term 'endogamy' is preferred given the simplification of educational group categories used in this study's analysis instead of the complete ordinal spectrum of educational attainment.

³ Unmarried couples include either cohabiting or living apart together partnerships.

and Germany.⁴ The focus of the current study is also not to examine specific country differences, but to test universal hypotheses regarding the way the Internet shapes endogamy patterns in partnering choices.

2. Theoretical background

2.1. Endogamy patterns and trends

Research on mate selection spanning over several decades has consistently indicated individuals' tendency of choosing partners from within their own educational, religious, and ethno-racial group (e.g., [Blau and Duncan, 1967](#); [Blossfeld and Timm, 2003](#); [Burgess and Wallin, 1943](#); [Mare, 1991](#); [Smits et al., 1998](#); for reviews, see [Blossfeld, 2009](#); [Kalmijn, 1998](#); [Schwartz, 2013](#)). The preference for marrying within one's own group can be explained through a number of factors, as follows: it ensures the cohesiveness and continuity of the group ([Sumner, 1906](#)), it sustains a positive and distinguishable social identity ([Tajfel, 1982](#)), it provides relationship security and rapport given common values and lifestyle ([Hutnik, 1991](#)), and it favors the transmission of socio-economic and cultural resources to the next generation ([Kalmijn, 1991](#)). Marital sorting (i.e., who marries whom) along education, race/ethnicity and religion has received particular scholarly attention given the relevance of assortative mating with respect to these indicators in gauging economic and social between-group boundaries ([Blau and Duncan, 1967](#); [Mare, 2000](#)). An overview of the patterns and trends associated with each of the three types of partnering sorting examined in the present study is provided below.

Research on patterns of educational assortative mating in both the U.S. and Germany provided evidence of a high level of educational homogamy ([Domański and Przybysz, 2007](#); [Fu and Heaton, 2008](#); [Rosenfeld, 2008](#)). On the background of educational expansion and increase in women's educational attainment as well as changing preferences away from the traditional female educational hypergamous (i.e., marrying up) model ([Brynin and Schupp, 2000](#)), studies examining German data indicated a trend of increasing educational homogamy over time among the lower educated, though with no clear trend among other groups (e.g., [Grave and Schmidt, 2012](#)). In the U.S., largely due to between-study differences in measurements and methodological design, findings are inconsistent regarding the direction of change in educational mating processes ([Fu and Heaton, 2008](#)). One line of empirical studies indicated that spouses' educational resemblance has sequentially increased over the last century (e.g., [Hou and Myles, 2008](#); [Kalmijn, 1991](#); [Qian and Preston, 1993](#)). A second group of studies uncovered non-linear trends, with educational homogamy first increasing, then decreasing over time (e.g., [Mare, 1991](#); [Liu and Lu, 2006](#)) or initially rising and afterwards declining ([Schwartz and Mare, 2005](#)). Finally, a third line of research suggested that the association of husbands' and wives' education remained relatively stable or slightly decreased in most of the 20th century ([Fu and Heaton, 2008](#); [Raymo and Xie, 2000](#); [Rosenfeld, 2008](#)).

In comparison to educational homogamy, *racial/ethnic endogamy* is much more prevalent, robust, and associated with less divergent research findings (Germany: [González-Ferrer, 2006](#); [Milewski and Kulu, 2013](#); U.S.: [Fu and Heaton, 2008](#); [Rosenfeld, 2008](#)). Despite hierarchical patterns of crossing racial/ethnic boundaries in partnership choices and preferences ([Bonilla-Silva, 2004](#); [Fu, 2001](#); [Potarca and Mills, 2015](#)), and different trajectories of assimilation for different groups ([Alba and Nee, 2003](#)), empirical studies examining changes over the last century found overall trends of declining same-race/ethnicity partnering and increasing intermarriage rates (Germany: [Lucassen and Laarman, 2009](#); [Schroedter, 2006](#); [Todd, 1994](#); U.S.: [Fu and Heaton, 2008](#); [Rosenfeld, 2008](#)).

Finally, when it comes to *religious endogamy*, research indicates strong homogamous patterns along religious lines in both countries included in this study (e.g., Germany: [Klein and Wunder, 1996](#); U.S.: [Bisin et al., 2004](#); [Blackwell and Lichter, 2004](#)). Nonetheless, the last decades witnessed both drops in rates of endogamy and increases in religious intermarriage (Germany: [Hendrickx, Schreuder, and Ultee, 1994](#); U.S.: [Lehrer, 1998](#); [Rosenfeld, 2008](#); [Sherkat, 2004](#)).

2.2. Social contexts of interaction – the supply side perspective of mate selection

As [Blau's \(1977\)](#) theory of social structure suggests, interpersonal choices are largely determined by the opportunities for contact that each social setting provides. What may appear as personal preference for similar others is in fact highly contingent on the configuration of contexts. The social settings or foci of activity in which people initiate and construct relations differ in the characteristics of individuals embedded in them ([Feld, 1984](#); [Marsden, 1990](#)). As a result, any study of personal relations needs to account for the social composition of different types of venues. Each context provides a distinctive pool of potential interaction partners (supply), from which people can select according to personal preferences (demand). The supply of contact opportunities supported by each social setting determines whether or not individuals can realize the previously discussed dominant preference for similar others. The more socially and culturally homogenous a context is, the higher the chances people have to associate with those sharing the same background. The supply-side perspective on assortative mating and its focus on the importance of local interaction opportunities has been connected to multiple types of close personal relations, ranging from marital or cohabiting unions (e.g., [Blau and Schwartz, 1984](#); [Kalmijn, 1998](#); [Kalmijn and Flap, 2001](#)), sexual relationships (e.g., [Laumann et al., 1994](#)), friendships and acquaintanceships (e.g., [McPherson and Smith-](#)

⁴ This includes an over-representation of the higher educated, those with previous union experience, and racial/ethnic minorities (e.g., [Feliciano et al., 2011](#); [Potarca and Mills, 2015](#); [Skopek et al., 2011](#)).

Lovin, 1987; Mollenhorst et al., 2008a), or core discussion networks (e.g., Mollenhorst et al., 2008b). This study continues this tradition by examining how meeting venues favor positive assortative mating with a particular focus on digital settings. In order to draw expectations about the contribution of the Internet in breeding endogamy, an overview of the social composition, supply of partner alternatives and general partnership market conditions provided by both conventional and digital meeting settings is outlined below.

2.2.1. Conventional meeting settings

Due to a balanced gender and age distribution and a subsequently large pool of young male and female candidates, *school settings* (i.e., ranging from primary school to university) constitute one of the most abundant partnership markets (Kalmijn and Flap, 2001). Schools display high levels of internal homogeneity in terms of educational level, predominantly for individuals at the upper end of the schooling distribution, who are inherently more uniform in their final educational attainment (Mare, 1991) and religious affiliation (Kalmijn and Flap, 2001). Meeting partners via school was therefore associated with strong and multiple endogamous effects, particularly with respect to education, class and religion (Kalmijn and Flap, 2001; Lampard, 2007; Mollenhorst et al., 2008a).

Workplaces are social contexts that are highly homogenous in socioeconomic status and education, but less segregated with respect to other ascribed characteristics such as race/ethnicity or religion (Feld, 1984; McPherson et al., 2001). One study therefore revealed that in the Netherlands romantic ties among co-workers are associated with high positive sorting with respect to education (Mollenhorst et al., 2008a). Another study, also focusing on the Dutch context, but with a different analytical approach and looking at different data, only encountered such effect among the highly educated, with workplace in fact encouraging educational mixing among the lower educated (Kalmijn and Flap, 2001). Nonetheless, research indicated that, as expected, work settings foster mixed partnering with respect to religion (Kalmijn and Flap, 2001; Mollenhorst et al., 2008a).

Personal networks consisting of *family members* and *friends* are usually highly homogeneous on ascribed characteristics such as race/ethnicity and religion (Feld, 1984; McPherson et al., 2001). Having friends and family as intermediaries in the mating market not only ensures opportunities for positive sorting along these lines, but also entails direct third party pressures to conform to endogamy norms (Kalmijn, 1998; Lampard, 2007). Once again, empirical findings remain inconclusive. Kalmijn and Flap (2001) found positive effects of family networks on religious endogamy, whereas Mollenhorst et al. (2008a) encountered no significant effects. Mixed results were found for *neighborhood* as well, which is presumed to be a context with high levels of homogeneity with respect to social class, race/ethnicity, and religion. Compared to other settings, neighborhoods were shown to favor either lower (Mollenhorst et al., 2008a) or higher religious similarity between partners (Kalmijn and Flap, 2001). Nonetheless, personal networks of family and friends, as well as neighborhoods were proven not to foster educational similarity between partners in either study (Kalmijn and Flap, 2001; Mollenhorst et al., 2008a).

Other settings that are not clearly linked to either high or low endogamy are public places for drinking, eating, or socializing, broadly labeled as *leisure settings* in this study. Such optionally selected contexts generally present lower structural constraints and higher chances of meeting people of different backgrounds (Bozon and Héran, 1989). Similarly, *voluntary associations* were found not to foster couple endogamy with respect to either achieved or ascribed characteristics (Kalmijn and Flap, 2001; Mollenhorst et al., 2008a). Nonetheless, both leisure settings and voluntary associations preserve some degree of social and cultural segregation (Lampard, 2007). Certain voluntary associations, for instance, are religion-affiliated (Feld, 1984) or targeted towards specific groups (e.g., youth organizations, professional organizations), resulting in particular types of social composition and thus endogamy (McPherson et al., 2001). Finally, *religious venues* are known for high levels of religious homogeneity (Feld, 1984), which should promote a high degree of religious endogamy among couples that met through church-related activities.

2.2.2. Digital partnership markets

As previously noted, current studies of partner preferences and interaction observed on Internet dating platforms reveal positive assortative mating patterns along multiple social lines. Skopek et al. (2011) showed that educational similarity influences contact and response behavior in the initial stages of online dating. Even after controlling for the opportunity structure on the platform, the authors found first and reciprocal contacts to be highly homophilous in terms of education, particularly among women. Various research addressing racial preferences in online dating in both the U.S. and Europe pointed to the endurance of same-race preferences and typical racial hierarchies (Wilson et al., 2007; Feliciano et al., 2009, 2011; Yancey, 2009; Lewis, 2013; Lin and Lundquist, 2013; Robnett and Feliciano, 2011; Tsunokai et al., 2014; Potarca and Mills, 2015). Finally, studies that examine the religious preferences of online daters indicated that both men and women are more likely to contact potential partners with the same religious affiliation (Fiore and Donath, 2005; Hitsch et al., 2010). Other online venues could also lead to couple endogamy. For instance, social networking sites help people maintain ties with former high school classmates (Ellison et al., 2007), allowing schools to operate as partnership markets further into the age of adulthood and ensure educational similarity between partners (Schwartz, 2013). The scarcity of knowledge regarding the socio-demographic profile of individuals interacting in other online settings (e.g., chat rooms, online gaming, online communities) makes it difficult to assess the relative composition of these digital partnership markets beyond what is known about the population of Internet users in both the U.S. and Germany, which points to an over-representation of men, the young and highly educated (Eurostat, 2011; Smith and Duggan, 2013). Cacioppo et al. (2013) provide some clues about the differences in demographic composition between digital settings by examining the characteristics of individuals who met

their spouse through various online venues. For instance, the authors show that respondents who met their spouse via social network sites were younger compared to all other online venues; or that individuals who met through online communities and chat rooms are more likely to belong to racial minority groups. While acknowledging the multiple particularities of these various online contexts, it is beyond the scope of this research to focus on the specific endogamy patterns promoted by each online setting. This study assumes that online meeting venues broadly differ from offline settings of interaction by displaying unique features of accessibility, weakening of geographic and temporal constraints, and particular forms of communication (Antoci et al., 2013; Golder and Macy, 2014; Hall, 2014).

The specific design of Internet dating platforms, online social networks or online communities allows for the screening of potential partners based on key socio-demographic characteristics. This facilitates and reduces the cost of searching and eventually finding a partner that shares the same background (Schwartz, 2013). In addition to allowing for the selection of a similar partner with minimum efforts, an easy to access supply of partner candidates implies that online venues would favor the materialization of similarity preferences to a higher extent than conventional settings for meeting and mating (Finkel et al., 2012; Schwartz, 2013). A theoretically more accessible pool of similar others as prospective partners would also entail much better chances of matching with someone on more than one characteristic, boosting the number of overall endogamous unions. The hypothesis that follows is that in both countries the Internet should promote more educational, ethno-racial and religious endogamy in comparison to other meeting settings.

Nevertheless, the Internet brings together people who, due to lack of access and time, remain underexposed in traditional settings (Sprecher, 2009), and it offers numerous opportunities for interaction, less restricted by geography, time, or social belonging. As Blau and Schwartz (1984) demonstrated, a high degree of social heterogeneity leads to more frequent inter-group relations and unions transgressing social boundaries. Given that the online environment ensures increased exposure to socio-demographic diversity and a weakening of third party control (Rosenfeld and Thomas, 2012; Schwartz, 2013), individuals are more 'at risk' of forging romantic relationships with dissimilar others. When contrasting couples that met through the Internet with couples that met via family, Rosenfeld and Thomas (2012) found no difference between the two groups with respect to partners' educational gap. They also revealed that same-race partnering is as frequent among those who met online as it is among the couples that met via family members. When it comes to the ways in which new forms of technology affect religious endogamy, the authors ultimately showed that the Internet does favor interreligious partnering. This singular evidence suggests that online partnership markets have the potential to diminish certain, though not all, boundaries between social groups. The preferences of Internet users might also contribute to a higher tendency to forge inter-group relations. Research shows that individuals who are more at ease with digitally mediated social ties had a higher degree of racial diversity in their offline network (Tufekci and Brashears, 2014). The above arguments and empirical evidence, although limited, lead to a competing hypothesis, predicting that in the U.S. as well as Germany, online venues should be associated with less educational, ethno-racial and religious endogamy than offline meeting settings.

3. Data and methods

3.1. Sample

For U.S. couples, this study uses data from the first wave of the *How Couples Meet and Stay Together (HCMST)* survey (Rosenfeld et al., 2011), which took place in 2009. HCMST is a nationally representative longitudinal survey of English-speaking adults in the U.S., which oversampled lesbian and gay respondents (for a more detailed description of survey design, see Rosenfeld and Thomas, 2012). For German couples, analyses are based on data from the German Family Panel (*pairfam*), and the supplemental project 'Demographic Differences in Life Course Dynamics in Eastern and Western Germany' (*DemoDiff*), release 6.0 (Brüderl et al., 2015). *pairfam* contains information on the partnership and fertility trajectories of men and women born in 1971–1973, 1981–1983, and 1991–1993. A detailed description of the *pairfam* study and its cohort stratified random sample can be found in Huinink et al. (2011). *DemoDiff* consists of an oversample of Eastern Germans born in the years 1971–1973 and 1981–1983 (Kreyenfeld et al., 2011). Since the majority of respondents born in 1991–1993 have not completed their years of schooling, the study focuses only on German respondents born in 1971–1973, and 1981–1983. To compensate for this sample reduction, I use data on couples recorded during the first wave, as well as new couples that were identified during the next five waves of data collection (i.e., waves II to VI). If a respondent has one partner at an earlier wave and a different one at a later time, only the first recorded partnership is considered. The *pairfam* and *DemoDiff* data were gathered between 2008 and 2014, on a yearly basis.

Both U.S. and German surveys are largely interested in respondents who are in either a married or unmarried partnership, and inquire about the main socio-demographic characteristics of the respondent and their current partner, various aspects of their relationship, as well as the circumstances in which they met. For the HCMST survey, respondents were asked to recall how and where they originally met their partner, both in closed-ended and open-ended questions. Based on the answers to the open-ended question, the data managers created a scheme of meeting settings, which they used in recoding the original answers. In the case of *pairfam* and *DemoDiff*, respondents only answered a close-ended question

Among the 4002 respondents in the HCMST data set, 3009 declared to be in a romantic relationship at the time of the first wave. After removing cases with missing data on at least one of the variables of interest, the analysis is performed on a final sample of 2970 partnered respondents, aged between 19 and 95 years old. The *pairfam/DemoDiff* sample used in this study consists of 7771 partnered respondents aged between 24 and 42 years old, with non-missing individual or couple

information. Results in connection to the German sample thus need to be interpreted in light of the much younger age mean of its respondents.

3.2. Measurement of variables

The main characteristics examined in this research are respondent's and partner's educational level, race/ethnicity, and religion. First, *educational attainment* is measured differently in the two samples, based on each country's commonly used schema of educational classification. In the American sample, education distinguishes between 'less than high school', 'high school degree', 'some college', and 'bachelor's degree or higher'. In the German sample, the classification of educational level includes 9 categories according to the International Standard Classification of Education (ISCED) code adapted to the German institutional context. To ensure a consistent categorization of education across both countries, the variables gauging educational attainment in the German data-set were recoded to resemble the educational categorization in the U.S. as closely as possible, using the following 4-category scheme: 'primary and lower secondary' (including the few cases of no degree, and largely those that completed the first and second stage of basic education), 'upper secondary' (individuals with more specialized education usually beginning at age 15 or 16 years), 'post-secondary' (those that completed educational programs building on secondary education that prepare for labor market entry and/or tertiary education), and 'tertiary' (comprising of those with a bachelor's degree and/or post-graduate studies).

Second, race/ethnicity is measured according to each country's categorization of racial/ethnic groups. Employing a comparable scheme of racial/ethnic categories for both countries would allow for a better comparability of results. Nonetheless, national differences in immigration and racial history make this task unattainable. In the U.S., racial cleavages, particularly the Black-White divide, stem from a long history of race relations. In Germany, ethnic boundaries are mainly defined by more recent immigration flows starting in the second half of the 20th century (Bail, 2008). Furthermore, the main focus of the study to assess partners' overall level of association across various contexts of interaction in both countries (and not to examine partners' matching at the level of specific sub-groups), should remain undeterred by the use of different measurement classifications of race/ethnicity. Models of both educational and racial/ethnic couple endogamy are therefore tested separately for each country. For the U.S., *race/ethnicity* is a four-category variable with the following options: non-Hispanic White (reference group), non-Hispanic Black, Hispanic, and other. The first three categories are featured in the original coding of the data set, whereas the 'other' category was constructed by the author to lump together the non-Hispanic Asian or Pacific Islander, non-Hispanic American Indian, and non-Hispanic other racial groups due to insufficient cases. For Germany, *race/ethnicity* was constructed based on country of birth and nationality,⁵ and it distinguishes between native Germans, ethnic German immigrants (Aussiedler, referring to German minorities resettled from Eastern Europe), immigrants with Turkish origins (either first or second generation), and others (referring to all other respondents of non-German origins).

In the HCMST data set, *religion* is a categorical variable that measures both partners' religious affiliation at age 16. It differentiates between the following: Catholic, other Christian (broad recoded category referring to Baptist, Protestant, Mormon, Pentecostal, Eastern Orthodox, other Christian), non-Christian (generic recoded category including Jewish, Muslim, Hindu, Buddhist, other non-Christian), and no religion. Unfortunately, the variable measuring partner's religion in the *pairfam/DemoDiff* survey contains too many missing cases to be used in the analysis. Therefore, information referring to respondent's religion is also discarded.

The categorization of *meeting settings* in the HCMST data set is based on the multiple answers to the open-ended question of how respondents met their partner (as coded by the data managers). The original classification comprises of various meeting settings and intermediaries. To ensure maximum comparability of results between the two data-sets, I constructed the following ten categories for the U.S.: 1) Internet venues (including online dating platforms,⁶ online social networking sites, Internet gaming websites, Internet chat rooms, Internet communities, and other Internet settings); 2) friends (which also includes having met at a private party); 3) family; 4) neighbors (i.e., having met as neighbors or through neighbors); 5) leisure (broad recoded category that refers to non-organized socially constructed settings and that includes having met through the following: bar, restaurant, other public social gathering place, public space, blind date, vacation, business trip); 6) workplace (having met as co-workers or through co-workers, or as part of a customer-client relationship); 7) school (includes school and college); 8) religious venues (referring to church or other religious organizations); 9) voluntary organizations (e.g., social organization, health club/gym, volunteer service activity), and finally 10) other settings (broader category that refers to military service, non-Internet singles service, and (non-specified) others). 52.8 percent of respondents mention one meeting setting. However, a great deal of participants report two or more meeting venues. In order to properly contrast the Internet setting with each of the remaining nine meeting venues, I remove any potential overlap associated with this particular category. It is therefore assumed that the dating market for

⁵ In the absence of detailed measurements on individuals' origin, defining ethnic categories by country of birth and nationality is a commonly used practice in European studies (e.g., Koopmans and Schaeffer, 2015).

⁶ The majority of respondents that met their partner through online dating platforms used a website targeted at the general population, as detailed open-ended answers reveal. Only two respondents specified having met their partner on a religious-themed dating site and other two participants revealed meeting their partner on a race-specific dating site.

this particular group is primarily and exclusively the Internet. The data in fact show little overlap of the first setting category with the other settings, with most of overlapping cases referring to a combination of Internet and leisure settings. This is potentially related to the fact that individuals that first get to know each other through online venues eventually decide to meet face-to-face in public places such as bars or restaurants (as detailed responses to the open-ended questions also confirm). However, as mentioned above, I assume the Internet as the only meeting setting and treat it as mutually exclusive with respect to the other categories. To overcome the issues of overlapping cases among offline settings (e.g., lack of independence between observations, inflated sub-sample sizes), for each respondent that mentioned more than one social intermediary, the value of 1 indicating the ‘use’ of a meeting setting is divided by the total number of meeting venues so that the final sum of counts equals the actual sample size. For instance, for respondents that met their partner via both friends and school, the weight for each meeting place is 0.5.

The *pairfam/DemoDiff* survey applied the following single-answer classification of seven meeting settings: Internet,⁷ friends, family, leisure, work and school, voluntary organizations, and others. As opposed to the American sample, the German data do not differentiate between the two partnership markets of school and work.⁸ Finally, since the ‘other’ category is unspecified in the German data set, results related to this group will not be addressed for either country.

3.3. Analytical strategy

First, descriptive statistics will be presented to examine the key socio-demographic characteristics of the partnered individuals included in our samples, in connection to various meeting settings. Second, using the *logmult* package (Bouchet-Valat, 2014) in R, I fit log-multiplicative uniform difference (hereafter: *unidiff*) models (Erikson and Goldthorpe, 1992), also referred to as log-multiplicative layer effect models (Xie, 1992), to examine variations in the strength of partners’ association between meeting settings. The models represent a variant of log-linear models (Agresti, 1996; Hout, 1983) commonly used in the analysis of cross-tabulated data. When applied to the study of couple endogamy (e.g., Fu and Heaton, 2008; Mare, 1991), log-linear models in general present the key advantage of adjusting for the marginal distribution of both partners’ characteristics within the sample, thus controlling for the availability of individuals with certain traits in the population. Emerged in the literature on comparative intergenerational social mobility (Xie, 1992), the *unidiff* model is acknowledged for its ability to produce a global test of cross-table differences in row-column associations. The model is here applied to assess the strength of partners’ association for couples forged in the online space in comparison to those formed differently. The analysis is based on three-way cross-classifications of both partners’ characteristics and meeting settings ($4 \times 4 \times 10 = 160$ cells for the U.S.; $4 \times 4 \times 7 = 112$ cells for the German sample). The unweighted⁹ cell distributions that form the basis for the analysis can be found in the Appendix (Tables A1A and A1B).

Unidiff models require all cross-classified tables to display a common pattern of association, while allowing the magnitude of that association to vary across tables (Xie, 1992). It is a parsimonious test that produces one-dimensional contrasts between settings (Zhou, 2015). The *unidiff* model is thus ideal to inquire whether overall, the Internet fosters a higher degree of partners’ association, compared to various offline contexts of interaction. The mathematic description of the models is specified below:

$$\text{Log}(F_{ijk}) = \lambda + \lambda_i + \lambda_j + \lambda_k + \lambda_{ik} + \lambda_{jk} + \phi_k \psi_{ij},$$

where i indexes the categories of the row variable (i.e., partner i), j indexes the categories of the column variable (partner j), k indexes meeting setting, and F_{ijk} is the expected number of couples in each cell of the cross-classified tables. λ is the grand mean, while the λ_i and λ_j parameters adjust for the marginal distributions of partner’s i and partner’s j characteristics respectively. In different-sex couples, the male partner is assigned partner i , whereas the female partner is assigned partner j . In same-sex couples, the respondent in the data set is partner i , whereas the respondent’s partner is assigned partner j .¹⁰ The λ_k parameter adjusts for the numbers of couples associated with different meeting settings, while the λ_{ik} and λ_{jk} parameters control for the differences in partners’ characteristics across all types of settings. Finally, ϕ_k is a multiplicative term that applies to all cells in the table and that represents the relative strength of the association at a particular level (or layer) k , and

⁷ In waves I–III there is only one category “through the Internet”. Starting with wave 4, two separate categories “through an internet partner-finding service” and “through social networks, chat rooms, etc. on the internet” are included, which are lumped into the ‘Internet’ category for this study.

⁸ The *pairfam/DemoDiff* survey questionnaire distinguishes between school and work settings of meeting starting with the second wave of data collection. Nonetheless, the sample sizes of newly added couples that met via these settings are too small to allow for separate comparisons.

⁹ Analyses (available upon request) based on weighted cross-tabulations revealed similar results for both U.S. and German samples. For the *HCMST* data, the weights mainly adjust for the oversampling of self-identified gay and lesbian respondents, whereas the weights used in the analysis of German data correct for disproportionate sampling across cohorts.

¹⁰ The small percentage of respondents in same-sex couples in the German data set (i.e., 1.1%, $n = 85$) rules out separate analyses for same-sex partnerships. On the other hand, the substantially higher proportion of respondents in same-sex relationships in the case of the U.S. (i.e., 15.8%, $n = 468$) hinders analyses on heterosexual couples only, given a substantial reduction in sample size. Partners in same-sex arrangements are therefore mixed with those in heterosexual couples to ensure a comparable sampling strategy for both data sets. Supplementary analyses (described on pages 30–31) show that controlling for type of couple has little to no impact on the direction and strength of main results.

ψ_{ij} is equal to the general pattern of association between partner i and partner j . The model therefore estimates a single and comprehensive parameter of association for each layer (i.e., setting). Under the *unidiff* framework, any log-odds ratio in a given table represents the common log-odds ratio multiplied by the layer-specific effect.

To assess if the *unidiff* model provides the best fit to the data, its goodness of fit will be compared to two benchmark models, as follows: the null association model (i.e., a minimal baseline model assuming that partners' characteristics are independent while controlling for meeting setting); and the constant association model (i.e., asserts that there is an association between partner's characteristics, but this association is constant across all meeting settings). The latter adds $9 = (4-1) \times (4-1)$ extra parameters to the former by estimating λ_{ij} (i.e., the full-interaction between partner i 's by partner j 's characteristics, each measured via four-category items). The *unidiff* model supplements the constant association model by testing for between-setting differences in the strength of partners' association, therefore having 9 extra parameters (i.e., one for each meeting setting, except for the reference) in the American case, and 6 extra parameters in the German case. The formulas for the two additional models described above are as follows:

Null association model: $\text{Log}(F_{ijk}) = \lambda + \lambda_i + \lambda_j + \lambda_k + \lambda_{ik} + \lambda_{jk}$

Constant association model: $\text{Log}(F_{ijk}) = \lambda + \lambda_i + \lambda_j + \lambda_k + \lambda_{ik} + \lambda_{jk} + \lambda_{ij}$

In the attempt to investigate whether the data comply with the assumption of partners' association displaying a similar pattern across settings, mosaic plots (Friendly, 2002) that visually illustrate the relationship between partners' characteristics across contexts of interaction in each country, are graphed. Figs. A1A and A1B in the Appendix are mosaic plots based on the null model, which asserts that partners' characteristics are independent within each setting. The size of each rectangular tile is proportional to the observed frequency of each category (i.e., table cell), while the bipolar color mapping reflects the residuals (i.e., the lack of fit) resulted from the null model. Shades of red suggest negative deviations from independence, whereas shades of blue indicate large positive residuals, meaning there are more observations in a cell than what would be expected (Friendly, 1994; Zeileis et al., 2007) under the null model. Figs. A1A and A1B suggest that in both the U.S. and Germany, and across all three characteristics, frequencies deviating from independence, and the pattern of diagonal cells dominating (i.e., partner i and partner j are more likely to belong to the same group) are common for all contexts of interaction considered. Given the confirmation of this endogamous pattern across all settings, the presentation of results will specifically refer to couple endogamy (instead of partners' association).

The *unidiff* models estimated in this study specify a full-interaction pattern of association (i.e., all parameters are affected by the layer effect) between partner i and partner j . The full-interaction specification is a standard and flexible way of modeling the row-column association (for more details, see Hout, 1983).¹¹ The log-odds parameter for the reference setting is constrained to zero (or one, if exponential), and the coefficients for each of the remaining nine (in the American sample)/six (in the German sample) settings represent deviations from this baseline category. Given this study's goal of examining the extent to which online venues promote endogamy, the Internet context is set as the reference level. I report exponential layer scores and goodness-of-fit statistics for each model. Because the Bayesian Information Criterion (Raftery, 1986) tends to favor more parsimonious models when dealing with small-size samples (Weakliem, 1999), I only rely on the log-likelihood-ratio statistic (L^2) in selecting the model with the best fit.

4. Results

4.1. Descriptive results

Tables 1A and 1B present descriptive statistics for the American and German data used in the analyses of educational, racial/ethnic, and religious endogamy, by meeting setting. Most U.S. respondents mention having met their partner through friends (40.6%) or via leisure settings (29.5%), whereas German respondents most often specify that they met their match through friends (31.6%), but also via the workplace or school (21.3%). Individuals who selected their partner through the Internet comprise 9.4% of the American sample, and 6.1% in the German sample. 81.1% (i.e., cumulated 39.3% with some college and 41.8% with a bachelor's degree and higher) of U.S. respondents who met their partner online have at least some college education, compared to 48.8% (i.e., cumulated 24.5% with some college and 24.3% with a bachelor's degree and higher) in the case of those that were introduced to their partner through family members. In the German sample, only 47.1% of the individuals who met their partner through the Internet have either post-secondary (14.6%) or tertiary education (32.5%). Whereas in the case of the U.S., non-White respondents (particularly Hispanics) are greatly represented among those who met their match through online venues, in the German sample natives are highly numerous among those that met their partner online, more so compared to most other meeting contexts. In both American and German samples, online settings are more frequently linked to same-sex couples, younger respondents and relationships of shorter duration. Finally, individuals who met their partner online are less likely to be married and have resident children, but also more likely to have been previously married.

¹¹ Additional specifications imposing only diagonal parameters to be affected by the layer effect fit less well than the full-interaction models according to the log-likelihood-ratio statistic, and also reveal similar results (analyses available upon request).

Table 1A
Respondent and couple characteristics, by meeting setting (U.S.).

	Internet	Friends	Family	Neighbors	Leisure	Workplace	School	Religious venues	Voluntary organizations	Others	Total
<i>Column %</i>											
<i>Respondent's education</i>											
Less than high school	4.6	9.7	16.7	12.7	12.5	7.8	4.3	8.6	7.2	16.6	10.6
High school	14.3	26.9	34.5	21.6	27.4	29.0	17.1	22.7	19.6	24.6	24.8
Some college	39.3	25.6	24.5	27.2	26.8	28.8	28.8	28.8	27.8	35.8	29.0
Bachelor's degree or higher	41.8	37.8	24.3	38.4	33.3	34.4	49.8	39.9	45.4	23.0	35.5
<i>Respondent's race</i>											
White	76.1	79.5	81.5	85.8	77.2	80.1	80.3	85.9	81.4	75.9	77.9
Black	6.4	6.3	6.9	5.6	8.9	6.6	6.2	5.1	6.2	5.9	7.7
Hispanic	12.1	9.8	8.7	6.3	10.5	11.1	9.6	8.1	7.2	11.8	10.4
Other	5.4	4.4	2.9	2.2	3.4	2.2	3.9	1.0	5.2	6.4	3.9
<i>Respondent's religion</i>											
Catholic	25.7	28.5	29.8	22.0	29.9	30.1	22.2	15.7	28.5	27.8	27.4
Other Christian	52.1	52.7	54.3	60.8	53.7	54.6	59.6	76.3	55.7	53.5	54.8
Non-Christian	7.9	5.3	5.6	5.2	5.5	4.2	5.3	5.1	4.8	8.6	5.5
No religion	14.3	13.4	10.2	11.9	10.9	11.1	13.0	3.0	11.0	10.2	12.2
Same-sex couple	35.4	13.0	2.9	10.1	15.3	13.1	7.7	6.1	27.8	14.4	15.8
Married couple	32.9	69.2	79.1	71.3	66.1	68.7	76.3	81.3	58.8	74.3	64.1
Previously married	34.3	22.8	25.8	22.8	30.3	34.6	8.3	21.7	29.2	32.1	27.9
<i>Mean (Standard Deviation)</i>											
Respondent's age (range: 19–95)	39.36 (12.19)	45.75 (15.56)	48.00 (16.55)	46.16 (15.98)	49.06 (15.48)	47.18 (14.75)	40.73 (16.28)	46.85 (18.83)	48.03 (16.65)	52.83 (16.16)	46.48 (46.48)
Number of children in respondent's household (range: 0–7)	0.37 (0.86)	0.51 (0.90)	0.55 (0.96)	0.50 (0.88)	0.45 (0.89)	0.53 (0.95)	0.62 (0.98)	0.57 (0.96)	0.38 (0.80)	0.45 (0.92)	0.48 (0.91)
Length of relationship (range: 0.05–71)	4.36 (4.04)	18.57 (15.17)	22.32 (17.01)	20.38 (15.83)	19.31 (15.7)	17.85 (14.28)	19.42 (16.19)	20.35 (16.96)	16.49 (14.25)	24.90 (18.68)	17.65 (15.60)
% of all couples	9.4	40.6	15.1	9.0	29.5	18.5	17.9	6.7	9.8	6.3	100.0
Total N	280	1206	449	268	877	549	532	198	291	187	2970

Source: HCMST, wave I.

4.2. Results from the log-multiplicative unidiff models

Firstly, the goodness of fit of the three different models (i.e., null association, constant association, and *unidiff*) is comparatively assessed. The null model has already proven inadequate according to the mosaic plots in Figs. A1A and A1B. The residuals resulting from the model are large enough to indicate that frequencies deviate from independence. As the measures of fit corresponding to U.S. data in Table 2A show, adjusting for the association between partner *i* and partner *j* in the constant association model produces a large improvement in fit in connection to all three characteristics. The second last column reveals a drastic and significant reduction of the goodness-of-fit chi-square. The *unidiff* models however further improve the fit to the data in comparison to the constant association model, for all three characteristics. For education for instance, there is a significant 37.9 improvement in the likelihood ratio chi-square, for the loss of 9 degrees of freedom ($p < 0.001$). Table 2B contains results corresponding to German data. With significant improvements of 29 and 27.6 respectively in the likelihood ratio statistic on 6 residual degrees of freedom ($p < 0.001$), the *unidiff* models of educational and racial/ethnic endogamy for Germany similarly indicate a better fit compared to the constant association model.

To investigate assortative mating patterns in online dating compared to other places of meeting and mating, I now proceed to analyzing the setting-specific patterns revealed by the multiplicative interactions. Tables 3A and 3B provide the exponential layer estimates based on *unidiff* models of educational, racial/ethnic, and religious endogamy. Recall that in conjunction with the theoretical discussion related to the supply side perspective of partnership choices, the study put forth two competing hypotheses, namely that in comparison to offline conventional meeting settings, the Internet would promote either *more* or *less* educational, racial/ethnic and religious endogamy. Findings in Tables 3A and 3B show that the data partly support the second hypothesis. Looking at education, results in Table 3A indicate that in the U.S., friends and particularly school settings, which display the largest effect size, significantly promote more similarity between partners in terms of educational attainment, compared to the Internet. The intermediaries of neighbors, religious venues, and to a lower extent family and leisure, also display stronger associations between partners' educational level, but the differences are non-significant. Work and voluntary associations are almost non-distinguishable from the online category. In the German case, work and school settings combined are linked to significantly more educational endogamy than online venues (Table 3B). Though non-significant, meeting via friends is related to a slightly higher association between partners' educational level,

Table 1B
Respondent and couple characteristics, by meeting setting (Germany).

	Internet	Friends	Family	Leisure	Workplace & school	Voluntary organizations	Others	Total
<i>Column %</i>								
<i>Respondent's education</i>								
Primary and lower secondary	7.4	9.0	30.7	8.3	5.1	3.2	12.0	8.7
Upper secondary	45.4	49.8	45.0	53.2	37.3	45.8	48.7	46.9
Post-secondary	14.6	11.6	7.9	10.1	12.2	12.8	9.2	11.4
Tertiary	32.5	29.5	16.4	28.4	45.4	38.3	30.2	33.0
<i>Respondent's race/ethnicity</i>								
German	90.2	82.0	51.9	84.8	87.1	93.4	83.1	83.7
Ethnic German	3.0	5.9	6.1	4.9	2.8	1.4	5.6	4.5
Turkish background	0.8	3.4	20.9	2.6	1.2	0.6	3.1	3.2
Other	5.9	8.8	21.2	7.7	8.9	4.7	8.2	8.6
Same-sex couple	4.9	0.9	0.3	0.8	1.1	0.3	1.3	1.1
Married couple	20.2	50.3	73.0	57.5	50.9	52.7	47.5	51.1
Previously married	11.5	4.1	2.6	3.1	4.7	3.6	8.5	4.7
<i>Mean (Standard Deviation)</i>								
Respondent's age (range: 24–42)	30.76 (5.13)	31.27 (5.08)	31.69 (5.03)	32.02 (5.08)	32.09 (5.04)	32.16 (5.02)	32.59 (5.08)	31.76 (5.09)
Number of children in respondent's household (range: 0–10)	0.48 (0.82)	0.96 (1.08)	1.55 (1.25)	1.03 (1.03)	0.98 (1.06)	0.96 (1.04)	1.06 (1.17)	0.98 (1.08)
Length of relationship (range: 0.00–35.5)	2.45 (2.45)	7.60 (5.82)	9.03 (6.36)	8.69 (6.32)	7.92 (6.22)	8.33 (6.17)	7.28 (6.04)	7.68 (6.11)
% of all couples	6.1	31.6	4.9	19.8	21.3	8.6	7.8	100.0
Total N	471	2455	378	1538	1653	666	610	7771

Source: pairfam/ DemoDiff, waves I–VI.

compared to the Internet. The estimates for voluntary organizations and family also point to higher educational endogamy, but the magnitude of the effects is rather low.

Findings also show that in both countries, online settings are associated with lower racial/ethnic endogamy compared to all other meeting venues. For the U.S., almost all differences are significant, with the largest estimates being encountered for religious venues, neighbors, school and family. The German data reveals that the settings of family and friends are linked to significantly more racial/ethnic endogamy, with voluntary associations, leisure settings, work and school also fostering more racial/ethnic endogamy compared to the Internet, though contrasts are not significant.

Finally, in the U.S. online venues are shown to have a significantly weaker association between partners' religion compared to all offline settings considered, except voluntary organizations. Religious endogamy seems to be particularly favored by religious settings, as well as by school settings, or family.

4.3. Additional analyses

Given that the two data-sets capture prevailing relationships at the time of the survey instead of recently formed partnerships, one needs to account for the fact that similarity might not be determined by assortative mating only. The characteristics of partners in long-lasting relationships could also converge over time (Kalmijn, 2005). Once partnerships have been established, partners can influence each other's educational achievements (Fu and Heaton, 2008). In the case of Germany, second generation immigrants (i.e., born in Germany to non-German parents that did not acquire German citizenship at birth, nor on their own) married to German citizens could also have been naturalized during the course of a long-term marriage. One way of controlling for subsequent adjustments after a partnership is formed is to include a factor of relationship duration. However, due to difficulty of including a high number of covariates in *unidiff* models and in log-linear analyses in general, additional *unidiff* analyses are performed on a sub-group of respondents in short-duration partnerships instead. This strategy is also meant to minimize the issue of selective relationship and the fact that exogamous couples have a higher risk of union dissolution (Kalmijn et al., 2005). Given that couples that met in offline settings are more likely to be part of long-term partnerships (as seen in Tables 1A and 1B), the previous analysis could overstate the difference in level of couple endogamy between offline and online matches.

Tables 4A and 4B report layer estimates of educational and racial/ethnic endogamy in the U.S. and Germany, for short-duration couples. Short-duration relationships are defined as partnerships not longer than five years. This cut-off point was chosen to ensure a proper sub-sample size that could allow for the estimation of *unidiff* models. The sample size for this sub-set of respondents reaches 743 in the U.S. (including 189 individuals who met their match online), and 3179 (out of which 386 met their partner over the Internet) in Germany. Because respondent's and partner's religion were gauged by looking at religious affiliation at age 16, the possibility of partners' convergence in traits over time distorting results in the case of religious endogamy in the U.S. can be excluded. Therefore, I only examine endogamy patterns for short-duration partnerships

Table 2A

Goodness-of-fit statistics for selected models of educational, racial/ethnic and religious endogamy (U.S.).

Model	df	Δdf	L^2	p	ΔL^2
Educational endogamy					
Null association model (NA)	90		896.3	0.00	
Constant association model (NA + partners' association)	81	9	94.5	0.15	801.8***
Unidiff model (NA + partners' association \times setting)	72	9	56.6	0.91	37.9***
Racial/ethnic endogamy					
Null association model (NA)	90		1416.3	0.00	
Constant association model (NA + partners' association)	81	9	98.0	0.10	1318.3***
Unidiff model (NA + partners' association \times setting)	72	9	66.7	0.65	31.3***
Religious endogamy					
Null association model (NA)	90		664.4	0.00	
Constant association model (NA + partners' association)	81	9	108.7	0.02	555.7***
Unidiff model (NA + partners' association \times setting)	72	9	63.8	0.74	44.9***

Note: 160 cells. *df* represents residual degrees of freedom. Δdf is the difference in degrees of freedom compared to the previous model. L^2 is the likelihood ratio chi-square for goodness of fit. ΔL^2 represents the reduction in L^2 compared to the previous model. *p* is the probability $P(\chi^2_{df} \geq L^2)$.

****p* < 0.001.

Table 2B

Goodness-of-fit statistics for selected models of educational, and racial/ethnic endogamy (Germany).

Model	df	Δdf	L^2	p	ΔL^2
Educational endogamy					
Null association model (NA)	63		1547.7	0.00	
Constant association model (NA + partners' association)	54	9	96.7	0.00	1451.0***
Unidiff model (NA + partners' association \times setting)	48	6	67.7	0.03	29.0***
Racial/ethnic endogamy					
Null association model (NA)	63		3479.7	0.00	
Constant association model (NA + partners' association)	54	9	98.7	0.00	3381.0***
Unidiff model (NA + partners' association \times setting)	48	6	71.1	0.02	27.6***

Note: 112 cells. *df* represents residual degrees of freedom. Δdf is the difference in degrees of freedom compared to the previous model. L^2 is the likelihood ratio chi-square for goodness of fit. *p* is the probability $P(\chi^2_{df} \geq L^2)$. ΔL^2 represents the reduction in L^2 compared to the previous model.

****p* < 0.001.

Table 3AExponential layer estimates based on *unidiff* models of educational, racial/ethnic and religious endogamy (U.S.).

	Educational endogamy	Racial/ethnic endogamy	Religious endogamy
Meeting setting:			
Internet (reference)	1.00 (0.72, 1.40)	1.00 (0.76, 1.32)	1.00 (0.64, 1.57)
Friends	1.50 (1.30, 1.72)*	1.63 (1.45, 1.83)**	1.88 (1.61, 2.20)**
Family	1.18 (0.88, 1.59)	1.80 (1.45, 2.24)***	2.51 (2.02, 3.11)***
Neighbors	1.56 (1.16, 2.10)	1.93 (1.41, 2.63)**	1.38 (0.83, 2.29)**
Leisure	1.14 (0.96, 1.36)	1.51 (1.32, 1.73)**	1.85 (1.55, 2.20)**
Workplace	1.08 (0.85, 1.37)	1.41 (1.18, 1.68)*	1.32 (0.97, 1.81)*
School	2.11 (1.77, 2.52)***	1.88 (1.57, 2.24)***	2.26 (1.82, 2.81)***
Religious venues	1.44 (1.02, 2.06)	2.30 (1.58, 3.33)***	3.88 (2.78, 5.42)***
Voluntary organizations	1.01 (0.69, 1.50)	1.44 (1.07, 1.93)	1.36 (0.87, 2.14)
Others	0.90 (0.54, 1.50)	1.12 (0.80, 1.57)	1.98 (1.39, 2.81)

Note: 95% quasi-confidence intervals are in parentheses. Their values are computed as exponential of the layer coefficient ± 1.96 quasi-standard errors and are therefore asymmetrical.

p* < 0.05 *p* < 0.01 ****p* < 0.001.

in connection to education and race/ethnicity. There are, albeit few, certain deviations from patterns observed for the total sample when it comes to short-duration partnerships. In the U.S., respondents in unions not longer than 5 years who met their partner online are significantly less endogamous with respect to education only compared to those who met their partner through school. Furthermore, short-duration couples forged on the Internet in the U.S. are significantly less endogamous with respect to race/ethnicity than those established through intermediaries such as leisure, family, school, and friends. In Germany, online settings are associated with significantly lower racial/ethnic endogamy only compared to family.

The following results were also recorded for short-duration couples, but failed to reach significance most likely due to the reduction in sample size. In Germany, the combined setting of work and school yields higher educational endogamy compared to the Internet. Family, leisure settings and voluntary organizations in both countries appear to foster less

Table 3BExponential layer estimates based on *unidiff* models of educational, and racial/ethnic endogamy (Germany).

	Educational endogamy	Racial/ethnic endogamy
Meeting setting:		
Internet (reference)	1.00 (0.78, 1.29)	1.00 (0.81, 1.24)
Friends	1.19 (1.08, 1.31)	1.36 (1.28, 1.44)**
Family	1.04 (0.82, 1.31)	1.61 (1.40, 1.85)***
Leisure	0.97 (0.83, 1.13)	1.20 (1.11, 1.30)
Workplace & school	1.47 (1.33, 1.62)**	1.20 (1.09, 1.32)
Voluntary organizations	1.09 (0.88, 1.35)	1.32 (1.10, 1.57)
Others	1.29 (1.08, 1.54)	1.14 (1.00, 1.31)

Note: 95% quasi-confidence intervals are in parentheses. Their values are computed as exponential of the layer coefficient ± 1.96 quasi-standard errors and are therefore asymmetrical.

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$.

educational endogamy compared to online venues, but estimates are not only non-significant, but also small in magnitude. In the U.S., voluntary organizations and religious venues are linked to substantially greater racial/ethnic endogamy than online settings. As opposed to previous results found for the total German sample, short-duration couples that met through work, school, or leisure settings, are less ethnically endogamous than couples formed online, but differences are small.

While *unidiff* models present the key advantages of not being affected by unequal marginal distributions and of delivering comprehensive statistics of how partners' association varies across settings, as previously noted, they do not allow for the inclusion of a high number of covariates or continuous predictors. To ensure the consistency of empirical evidence across analytical methods, logistic regression models of endogamy are also estimated. For this purpose, dummy-coded variables of educational, ethno-racial, and religious endogamy are created, with the value '1' indicating that partners share the same educational level, racial background, and religious affiliation respectively. Unlike *unidiff* models, logistic regression analysis imposes the choice of a dependent variable, is unable to account for marginal distributions, and cannot model the full interaction between partners' characteristics. Nonetheless, it allows for the inclusions of a series of both continuous and categorical control variables. For each characteristic, a model is estimated including the effects of meeting settings, respondent's main characteristic (e.g., respondent's educational level for the educational endogamy model), and a series of controls measuring the following: gender, respondent's age at the time of the survey, type of couple (opposite-sex versus same-sex), being married, having been previously married, number of children in respondent's household, and length of the relationship (in years). Recall the multiple-answer that meeting setting was measured with in the *HCMST* survey and that the 'Internet' category was the only one with no overlap with other categories. Therefore, for the U.S., each offline meeting setting is contrasted with the Internet category in separate logistic regression models. Results are reported in the *Appendix* in [Tables A2A and A2B](#). The magnitude and direction of effects almost entirely confirm previously discussed findings for short-durations couples in both countries,¹² suggesting that not being able to include various covariates does not bias the results yielded by *unidiff* models.

5. Discussion

This study revisited the supply perspective (Blau, 1977; Feld, 1984; Marsden, 1990) on assortative mating by exploring the role played by digital partnership markets in breeding couples' socio-demographic similarity. More precisely, it focused on the educational, racial/ethnic and religious endogamy of couples that met through online venues compared to couples formed through traditional intermediaries such as friends, family, neighbors, school, workplace, leisure, religious venues, voluntary organizations, and other settings. The study explored the importance of meeting venues for couples' endogamy among 2970 partnered individuals in the U.S. and 7771 partnered individuals in Germany. The two unique sources of survey data enabled an innovative test of assortative mating in online settings across two countries, thus allowing for more far-reaching conclusions about the impact of the Internet on couple endogamy. The study put forward two opposing hypotheses about the link between the Internet as context of meeting and couples' similarity. Due to the particularities of its market (i.e., access to a large pool of prospective mates, possibilities of browsing along key socio-demographic traits and easily screening for partners with a similar background), I first anticipated that the Internet allows individuals to more effectively choose according to the universally assumed preference for similarity (Kalmijn, 1998), and would thus promote more endogamy compared to conventional meeting settings. On the other hand, online venues represent an environment that ensures increased exposure to socio-demographic diversity and a reduced influence of third parties usually known to

¹² [Table A2A](#) indicates that couples who met online in the U.S. are significantly less racially endogamous than those that met through family members. This finding differs from what [Rosenfeld and Thomas \(2012\)](#) found in their study, given that the authors explore pairwise 'Internet – non-Internet' and 'family – non-family' comparisons, instead of more direct (e.g., 'Internet – family') contrasts as seen in the models presented in [Table A2A](#).

Table 4AExponential layer estimates based on *unidiff* models of educational, and racial/ethnic endogamy, for short-duration couples (U.S.).

	Educational endogamy	Racial/ethnic endogamy
Meeting setting:		
Internet (reference)	1.00 (0.78, 1.29)	1.00 (0.72, 1.40)
Friends	1.20 (1.05, 1.38)	1.54 (1.17, 2.03)*
Family	0.95 (0.70, 1.27)	1.95 (1.24, 3.07)*
Neighbors	1.25 (0.93, 1.68)	1.06 (0.24, 4.69)
Leisure	0.92 (0.77, 1.09)	1.95 (1.48, 2.56)**
Workplace	0.88 (0.69, 1.11)	1.15 (0.74, 1.81)
School	1.71 (1.44, 2.04)***	1.75 (1.14, 2.70)*
Religious venues	1.15 (0.81, 1.64)	1.71 (0.83, 3.52)
Voluntary organizations	0.82 (0.55, 1.21)	1.78 (0.91, 3.46)
Others	0.71 (0.42, 1.20)	0.95 (0.40, 2.25)

Note: 95% quasi-confidence intervals are in parentheses. Their values are computed as exponential of the layer coefficient ± 1.96 quasi-standard errors and are therefore asymmetrical.

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$.

Table 4BExponential layer estimates based on *unidiff* models of educational, and racial/ethnic endogamy, for short-duration couples (Germany).

	Educational endogamy	Racial/ethnic endogamy
Meeting setting:		
Internet (reference)	1.00 (0.76, 1.32)	1.00 (0.79, 1.27)
Friends	1.02 (0.85, 1.21)	1.05 (0.94, 1.19)
Family	0.83 (0.49, 1.41)	1.74 (1.35, 2.25)**
Leisure	0.88 (0.67, 1.15)	0.91 (0.76, 1.08)
Workplace & school	1.27 (1.07, 1.52)	0.84 (0.69, 1.02)
Voluntary organizations	0.95 (0.64, 1.40)	1.14 (0.85, 1.53)
Others	0.99 (0.72, 1.35)	0.81 (0.62, 1.07)

Note: 95% quasi-confidence intervals are in parentheses. Their values are computed as exponential of the layer coefficient ± 1.96 quasi-standard errors and are therefore asymmetrical.

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$.

enforce endogamous norms (Rosenfeld and Thomas, 2012; Schwartz, 2013), which would lead to decreased levels of couple endogamy.

Using log-multiplicative uniform difference models that allows for the strength of partners' association to vary along meeting settings, I find that the data confirm the second hypothesis, but only to a certain extent. In both countries online settings display weaker endogamy patterns compared to conventional settings usually linked to high couple endogamy rates, such as school, personal networks of family (and friends, particularly in the U.S.), or religious venues. School settings are confirmed as contexts that promote high levels of positive sorting along education or religion (Kalmijn and Flap, 2001). Family networks are also linked to more endogamy than online settings, especially with respect to the ascribed characteristics of race/ethnicity and religion, reflecting the high level of homogeneity of family-based ties (McPherson et al., 2001). As opposed to the finding of meeting via friends or leisure settings promoting more couple endogamy than the Internet in the U.S., having friends as social intermediaries and meeting through leisure activities are largely indistinguishable from online venues for the German sample. One explanation could be the fact that German respondents are much younger than those in the U.S. and the socio-demographic composition of Germans that met their match online is much closer in resemblance, especially in terms of education and age, to the composition of individuals who met via friends or leisure. Furthermore, organized and highly homogenous religious settings (Feld, 1984) foster high levels of couple similarity in the U.S., particularly when it comes to religion. When compared to other generally more heterogeneous contexts of meeting and mating such as work (in the U.S.), or voluntary organizations (in both countries), the Internet does not reveal significantly different patterns of couple endogamy. The workplace as partnership market favoring lower levels of educational endogamy is potentially related to the increased dynamism and diversification of the workplace in terms of training and skills in more recent years (Bianchi and Milkie, 2010). This result contradicts some previous research (Mollenhorst et al., 2008a), while supporting another that already found evidence of high educational exogamy among couples forged at work, particularly among the lower educated (Kalmijn and Flap, 2001).

First, these findings suggest that Internet's advantages of providing systemized tools and resources for meeting and connecting with similar others, and an easily accessible supply of prospective partners do not translate into more endogamous partner choices. The fact that online venues are linked to lower endogamy than school, family or religious venues contests the universal norm of wanting to partner within one's own group only. As Lampard (2007) suggests, individuals differ in how much they prefer to match with partners having the same socio-demographic background,

adjusting their choice for meeting venues accordingly. Individuals who are not particularly intent on partnering within their own group will self-select in contexts of meeting that allow for more exogamous choices. Given the heterogeneity and lower social control inherent in online partnering markets (Rosenfeld and Thomas, 2012), Internet users find it easier to choose partners with different socio-demographic profiles. The particularities of individuals who met their partner through the Internet (e.g., overrepresentation of the previously married) could play an additional role. Being divorced and facing a more restrictive (second) partnership market is presumed to alter standards for mate selection (Harknett, 2008) and bring about more openness towards inter-group partnering. Partner's education, for instance, was previously shown to represent a less conspicuous criterion in re-partnering choices, with educational endogamy being less common among second marital unions compared to first ones (Shafer, 2013). Nonetheless, including a factor of previous marital experience into the logistic regression models of educational, racial/ethnic and religious endogamy leaves the effects of meeting setting unchanged (results available upon request). Finally, it is possible that online mate selection de-emphasizes similarity with respect to socio-demographic characteristics while accentuating similarity in personality traits, lifestyle or leisure interests. An avenue for future research would be to find evidence of other non-socio-demographic types of similarity that Internet daters prioritize, across various age and cohort groups, and explore the profile of this selective group in more depth.

There are certain limitations of this study that need to be acknowledged. As with previous other studies that try to examine the supply side perspective of mate choice (Kalmijn and Flap, 2001; Mollenhorst et al., 2008a), this research also falls short in inspecting the actual composition of networks and contexts of interaction mediating the formation of couples (for an exception of data designed to measure actual opportunities for interaction with potential romantic partners, see Stauder, 2014). Furthermore, the modest sample size of the group of respondents who met their partner online in both data-sets did not allow for a more refined examination of endogamy patterns of subgroups (e.g., lower educated versus higher educated, Whites versus Blacks). Future research should also address the potential interdependence between education and race-related partner choices and provide a test of status exchange theory (Merton, 1941) in digital partnership markets. In conditions of minimal structural constraints and abundant opportunities of online interaction with in-group members, it would be compelling to examine whether highly educated minority members would still prefer to barter their high level of schooling for the high racial status of a White/native partner, or choose to match with a similarly educated in-group partner instead. Other shortcomings of the current study refer to measurement limitations and include the inability to examine religious endogamy for German couples, or to distinguish between various Internet settings in both samples, more precisely between online contexts specifically designed for partner selection (i.e., online dating platforms) and all other 'natural' online settings (Sprecher, 2009, p. 767). Additional analyses, available from author, using U.S. data, reveal that couples that met via 'natural' online venues (as a broad category) are slightly more racially endogamous than those that met via Internet dating sites, but do not display a higher degree of racial endogamy compared to offline settings of meeting and mating. Moreover, there are no differences between respondents that met their partner through online dating sites and those that met theirs via other online contexts when it comes to educational or religious matching. Finally, this study analyzed data from two Western countries with a similar marital culture, as well as a comparable spread and acceptance of Internet dating as a common channel for finding a partner. Such resemblances translated into similar findings on how online dating impacts mate selection and assortative mating. Future studies could use data on multiple and various national contexts to investigate the role of different marital cultures and norms, or population composition in online sorting patterns.

Despite limitations, this study provides a novel test of assortative mating in connection to the recent and increasingly popular online settings of partner selection. In fostering lower forms of couple similarity than the traditional matchmakers of school, family, friends, and church, the Internet plays a potential role in alleviating social barriers between groups, and could contribute to the recently decreasing trends in endogamy in connection to race/ethnicity or religion. Despite refuting skeptics' point of view (Henry-Waring and Barraket, 2008) in showing that online settings reduce the 'amount' of educational, racial/ethnic and religious endogamy in comparison to certain (though not all) partnership markets, results are still far from confirming Barlow's (1996) initial prediction according to which cyberspace would eventually eradicate boundaries of status and race.

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Appendix

Table A1A
Cross-tabulations of partners' characteristics by meeting setting (U.S.)

	Education				Race				Religion			
	I.	II.	III.	IV.	I.	II.	III.	IV.	I.	II.	III.	IV.
<i>Internet</i>												
I.	0.00	3.00	5.00	2.00	188.00	10.00	15.00	8.00	24.00	28.00	6.00	12.00
II.	1.00	15.00	14.00	10.00	5.00	9.00	0.00	0.00	33.00	85.00	8.00	14.00
III.	6.00	22.00	53.00	37.00	16.00	3.00	9.00	1.00	2.00	9.00	3.00	6.00
IV.	2.00	8.00	31.00	71.00	6.00	3.00	3.00	4.00	10.00	20.00	4.00	16.00
<i>Friends</i>												
I.	24.92	26.20	13.17	4.00	506.05	3.33	21.50	21.00	101.45	77.25	7.33	24.58
II.	25.75	74.75	48.42	25.25	4.50	37.83	4.33	1.00	59.92	234.40	6.33	26.42
III.	17.00	46.75	90.70	40.25	30.58	5.50	24.67	3.33	7.50	9.33	13.25	7.83
IV.	3.83	27.75	54.08	166.82	11.17	2.00	1.00	11.83	26.95	45.67	3.92	37.50
<i>Family</i>												
I.	13.92	17.37	8.17	1.00	158.25	2.33	7.25	4.50	41.95	18.42	1.33	3.08
II.	13.83	27.92	18.08	9.00	1.67	14.58	1.00	0.00	15.50	81.05	0.50	6.75
III.	4.67	23.03	19.07	12.75	5.58	1.00	11.33	0.33	0.50	2.83	6.50	1.83
IV.	2.00	7.58	10.33	23.98	2.53	0.00	0.00	2.33	6.20	18.33	2.92	5.00
<i>Neighbors</i>												
I.	7.25	8.03	3.33	1.50	103.72	0.00	3.42	1.00	12.45	13.58	1.33	3.33
II.	4.92	10.83	7.33	3.33	0.00	8.92	0.33	0.50	13.08	53.23	3.83	3.58
III.	1.50	13.53	12.75	10.17	7.25	0.00	2.67	0.50	1.50	3.00	0.75	0.00
IV.	1.50	1.17	10.00	32.98	0.83	0.00	0.50	0.50	3.53	8.58	2.50	5.83
<i>Leisure</i>												
I.	20.67	18.83	17.17	7.67	395.70	6.33	20.58	12.33	86.50	63.58	5.00	9.25
II.	24.00	75.17	39.25	27.08	11.00	43.58	10.00	2.00	61.33	208.95	8.33	24.83
III.	19.33	47.75	70.95	38.08	23.25	4.00	31.33	2.50	6.50	5.33	8.67	5.00
IV.	8.33	18.42	45.75	99.53	4.70	0.00	3.50	7.17	24.37	28.58	5.08	26.67
<i>Workplace</i>												
I.	4.50	14.83	7.67	2.83	286.40	1.00	17.25	8.33	55.95	48.50	7.00	10.25
II.	8.00	50.08	24.08	24.33	3.83	23.17	3.83	0.50	47.92	137.90	5.67	15.50
III.	4.83	37.08	49.23	28.00	28.92	1.00	12.00	0.00	3.00	7.00	3.08	2.00
IV.	2.33	21.17	34.67	82.28	8.20	0.50	0.00	1.00	12.58	26.25	1.50	11.83
<i>School</i>												
I.	7.00	6.28	5.00	0.67	226.88	0.00	5.42	5.33	34.83	21.00	2.50	5.25
II.	4.08	20.42	21.83	5.50	2.33	18.50	1.50	0.50	25.00	131.02	1.33	14.83
III.	2.50	11.28	50.37	22.17	11.17	0.50	11.50	3.83	5.00	5.00	6.67	2.33
IV.	0.00	5.17	23.83	113.70	4.17	2.50	1.00	4.67	6.03	21.50	0.83	16.67
<i>Religious venues</i>												
I.	1.58	4.92	0.50	2.50	88.78	0.50	1.33	2.67	14.00	4.67	0.00	0.00
II.	2.83	10.58	4.92	1.83	0.00	5.17	1.50	1.00	3.17	72.70	0.50	1.00
III.	4.83	8.95	17.00	5.92	3.00	0.00	6.00	0.00	0.50	2.00	1.67	2.00
IV.	0.50	5.17	8.67	29.58	0.33	0.00	0.00	0.00	1.75	6.33	0.00	0.00
<i>Voluntary organizations</i>												
I.	2.17	4.17	2.33	0.83	113.10	2.50	2.25	3.83	16.28	17.83	2.50	3.25
II.	2.75	6.42	11.83	3.58	1.17	7.08	1.00	0.00	19.92	53.77	1.00	7.25
III.	5.67	10.03	14.82	17.17	9.75	1.50	2.00	1.50	4.00	4.50	3.00	0.50
IV.	2.00	8.58	13.42	46.45	2.87	0.00	0.00	3.67	1.08	8.75	2.25	6.33
<i>Others</i>												
I.	1.00	8.37	2.67	1.00	73.12	2.00	8.00	7.00	22.58	13.17	0.00	2.00
II.	9.83	11.83	9.25	3.08	1.50	7.17	2.50	0.50	10.17	40.98	3.50	2.83
III.	6.67	9.58	18.12	8.50	6.50	0.50	4.50	1.00	2.50	2.00	3.42	0.50
IV.	3.50	4.00	10.25	13.67	4.20	0.00	1.00	1.83	3.50	10.00	0.00	4.17

Note: Education: I = less than high school; II = high school; III = some college; IV = bachelor's degree or higher. Race: I = White; II = Black; III = Hispanic; IV = other. Religion: I = Catholic; II = Other Christian; III = Non-Christian; IV = no religion.

Source: HCMST, wave I.

Table A1B

Cross-tabulations of partners' characteristics by meeting setting (Germany)

	Education				Race/ethnicity			
	<i>I.</i>	<i>II.</i>	<i>III.</i>	<i>IV.</i>	<i>I.</i>	<i>II.</i>	<i>III.</i>	<i>IV.</i>
<i>Internet</i>								
<i>I.</i>	12	19	2	6	385	9	1	29
<i>II.</i>	25	132	33	34	3	6	0	4
<i>III.</i>	2	26	10	13	2	0	0	2
<i>IV.</i>	6	58	20	73	12	3	1	14
<i>Friends</i>								
<i>I.</i>	82	93	13	11	1893	26	11	89
<i>II.</i>	182	797	148	223	22	110	0	28
<i>III.</i>	11	92	44	48	23	1	65	4
<i>IV.</i>	22	239	105	345	55	18	2	108
<i>Family</i>								
<i>I.</i>	55	34	2	3	174	1	4	6
<i>II.</i>	60	93	17	14	1	19	0	9
<i>III.</i>	7	11	3	8	10	0	72	0
<i>IV.</i>	8	23	14	26	11	4	1	66
<i>Leisure</i>								
<i>I.</i>	38	47	12	12	1213	20	1	52
<i>II.</i>	92	564	84	132	12	42	0	17
<i>III.</i>	3	55	16	30	9	0	30	5
<i>IV.</i>	22	184	69	178	82	12	1	42
<i>Workplace & school</i>								
<i>I.</i>	34	38	3	12	1345	29	5	80
<i>II.</i>	56	394	64	126	8	23	1	14
<i>III.</i>	9	63	49	38	6	1	14	1
<i>IV.</i>	12	186	84	485	48	9	1	68
<i>Voluntary organizations</i>								
<i>I.</i>	6	14	1	6	595	5	1	14
<i>II.</i>	20	192	25	67	2	6	0	4
<i>III.</i>	3	29	9	10	1	0	2	1
<i>IV.</i>	2	91	50	141	20	2	0	13
<i>Others</i>								
<i>I.</i>	30	15	6	4	465	10	2	31
<i>II.</i>	50	200	30	42	6	21	0	6
<i>III.</i>	1	18	10	12	6	0	15	2
<i>IV.</i>	9	69	20	94	25	3	0	18

Note: Education: I = primary and lower secondary; II = upper secondary; III = post-secondary; IV = tertiary. Race/ethnicity: I = German; II = Ethnic German; III = Turkish background; IV = other.

Source: pairfam/ DemoDiff, waves I–VI.

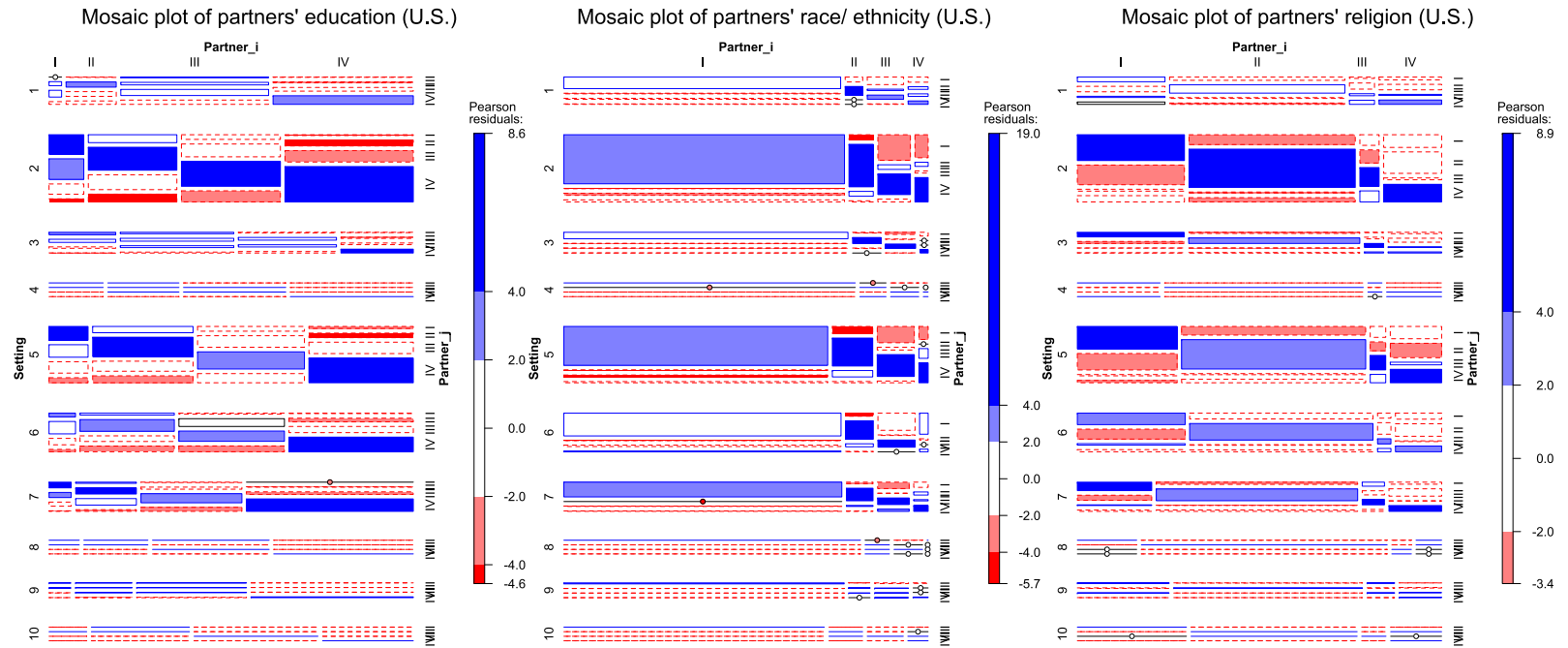


Fig. A1A. Mosaic plots of partners' characteristics (U.S.). *Note:* Education: I = less than high school; II = high school; III = some college; IV = bachelor's degree or higher. Race: I = White; II = Black; III = Hispanic; IV = other. Religion: I = Catholic; II = Other Christian; III = Non-Christian; IV = no religion. Setting: 1 = Internet; 2 = friends; 3 = family; 4 = neighbors; 5 = leisure; 6 = workplace; 7 = school; 8 = religious venues; 9 = voluntary organizations; 10 = others. *Source:* Table A1A.

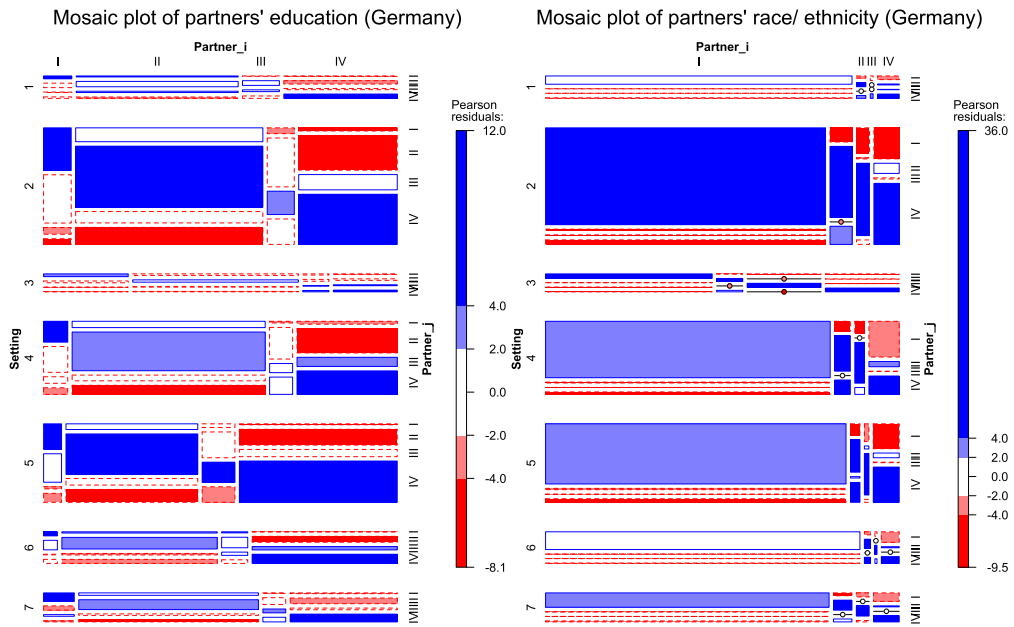


Fig. A1B. Mosaic plots of partners' characteristics (Germany). *Note:* Education: I = primary and lower secondary; II = upper secondary; III = post-secondary; IV = tertiary. Race/ ethnicity: I = German; II = Ethnic German; III = Turkish background; IV = other. Setting: 1 = Internet; 2 = friends; 3 = family; 4 = leisure; 5 = workplace & school; 6 = voluntary organizations; 7 = others. *Source:* Table A1B.

Table A2A

Logistic regression coefficients predicting educational, racial/ ethnic and religious endogamy (U.S.)

		Educational endogamy		Racial/ethnic endogamy		Religious endogamy	
Model 1	Meeting setting: (ref. Internet)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
<i>n</i> = 1486	Friends	0.23	(0.15)	0.21	(0.22)	0.26	(0.15)
Model 2	Meeting setting: (ref. Internet)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
<i>n</i> = 729	Family	-0.06	(0.21)	0.38	(0.31)	0.53*	(0.21)
Model 3	Meeting setting: (ref. Internet)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
<i>n</i> = 548	Neighbors	0.04	(0.23)	0.28	(0.37)	0.14	(0.23)
Model 4	Meeting setting: (ref. Internet)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
<i>n</i> = 1157	Leisure	0.09	(0.16)	0.25	(0.22)	0.20	(0.16)
Model 5	Meeting setting: (ref. Internet)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
<i>n</i> = 829	Workplace	0.01	(0.18)	0.02	(0.27)	0.02	(0.18)
Model 6	Meeting setting: (ref. Internet)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
<i>n</i> = 812	School	0.54*	(0.21)	0.54	(0.33)	0.55**	(0.21)
Model 7	Meeting setting: (ref. Internet)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
<i>n</i> = 478	Religious venue	0.50	(0.27)	0.63	(0.44)	1.25***	(0.30)
Model 8	Meeting setting: (ref. Internet)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
<i>n</i> = 571	Voluntary organizations	0.01	(0.21)	0.12	(0.31)	0.16	(0.21)
Model 9	Meeting setting: (ref. Internet)	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
<i>n</i> = 467	Others	-0.01	(0.27)	-0.57	(0.35)	0.12	(0.27)

Note: Models control for respondent's education, race/ethnicity, religion, gender, age, type of couple, being married, whether previously married, relationship duration, and number of children in household. Standard errors are in parentheses. ref. = reference category.

Source: HCMST, wave I.

p* < 0.05 *p* < 0.01 ****p* < 0.001.

Table A2B

Logistic regression coefficients predicting educational, and racial/ ethnic endogamy (Germany)

	Educational endogamy		Racial/ethnic endogamy	
Meeting setting: (ref. Internet)	0.00	(0.00)	0.00	(0.00)
Friends	0.01	(0.11)	0.33	(0.17)
Family	-0.10	(0.15)	0.91***	(0.24)
Leisure	-0.05	(0.12)	-0.09	(0.17)
Workplace & school	0.34**	(0.11)	0.09	(0.17)
Voluntary organizations	0.02	(0.13)	0.40	(0.22)
Others	0.13	(0.13)	-0.12	(0.20)

Note: Models control for respondent's education, race/ethnicity, gender, age, type of couple, being married, whether previously married, relationship duration, and number of children in household. Standard errors are in parentheses. ref. = reference category.

Source: pairfam/ DemoDiff, waves I–VI.

p* < 0.05 *p* < 0.01 ****p* < 0.001.

References

- Agresti, A., 1996. *An Introduction to Categorical Data Analysis*. Wiley, New York.
- Alba, R., Nee, V., 2003. *Remaking the American Mainstream: Assimilation and Contemporary Immigration*. Harvard University Press, Cambridge.
- Antoci, A., Sabatini, F., Sodini, M., 2013. Bowling alone but tweeting together: The evolution of human interaction in the social networking era. *Qual. Quant.* 48, 1911–1927.
- Bail, C.A., 2008. The configuration of symbolic boundaries against immigrants in Europe. *Am. Sociol. Rev.* 73, 37–59.
- Barlow, J.P., 1996. *A Declaration of the Independence of Cyberspace*. Retrieved January 20, 2014. <https://projects.eff.org/~barlow/Declaration-Final.html>.
- Barraket, J., Henry-Waring, M.S., 2008. Getting it on(line): Sociological perspectives on e-dating. *J. Sociol.* 44 (2), 149–165.
- Bianchi, S.M., Milkie, M.A., 2010. Work and family research in the first decade of the 21st century. *J. Marriage Fam.* 72, 705–725.
- Billari, F.C., Liefbroer, A.C., 2010. Towards a new pattern of transition to adulthood? *Adv. Life Course Res.* 15, 59–75.
- Bisin, A., Topa, G., Verdier, T., 2004. Religious intermarriage and socialization in the United States. *J. Polit. Econ.* 112, 615–664.
- Blackwell, D.L., Lichter, D.T., 2004. Homogamy among dating, cohabiting, and married couples. *Sociol. Quart.* 45, 719–737.
- Blau, P.M., 1977. *Inequality and Heterogeneity*. Free Press, New York.
- Blau, P.M., Duncan, O.D., 1967. *The American Occupational Structure*. Wiley, New York.
- Blau, P.M., Schwartz, J.E., 1984. *Crosscutting Social Circles: Testing a Macrostructural Theory of Intergroup Relations*. Academic Press, New York.
- Blossfeld, H.-P., 2009. Educational assortative marriage in comparative perspective. *Annu. Rev. Sociol.* 35, 513–530.
- Blossfeld, H.-P., Timm, A. (Eds.), 2003. *Who Marries Whom? Educational Systems as Marriage Markets in Modern Societies*. Kluwer Acad, Dordrecht.
- Bonilla-Silva, E., 2004. From bi-racial to tri-racial: Towards a new system of racial stratification in the USA. *Ethn. Racial Stud.* 27, 931–950.
- Bouchet-Valat, M., 2014. *logmult: Log-multiplicative Models, Including Association Models*. R. package version 0.6.1. <https://github.com/nalimilan/logmult>.
- Bozon, M., Héran, F., 1989. Finding a spouse: A survey of how French couples meet. *Population* 44, 91–121.
- Brüderl, J., Hank, K., Huinink, J., Nauck, B., et al., 2015. *The German Family Panel (pairfam)*. GESIS Data Archive, Cologne, ZA5678 Data file Version 6.0.0.
- Brynin, M., Schupp, J., 2000. Education, employment, and gender inequality amongst couples: A comparative analysis of Britain and Germany. *Eur. Sociol. Rev.* 16, 349–365.
- Burgess, E.W., Wallin, P., 1943. Homogamy in social characteristics. *Am. J. Sociol.* 44, 109–124.
- Cacioppo, J.T., Cacioppo, S., Gonzaga, G.C., Ogburn, E.L., VanderWeele, T.J., 2013. Marital satisfaction and break-ups differ across on-line and off-line meeting venues. *P. Natl. Acad. Sci. U. S. A.* 110, 10135–10140.
- Caldera Sánchez, A., Andrews, D., 2011. Residential mobility and public policy in OECD countries. *OECD J. Econ. Stud.* 1, 2011.
- Castells, M., 2001. *The Internet Galaxy: Reflections on the Internet, Business and Society*. Oxford University Press, Oxford.
- Domański, H., Przybysz, D., 2007. Educational homogamy in 22 European countries. *Eur. Soc.* 9, 495–526.
- Ellison, N.B., Steinfield, C., Lampe, C., 2007. The benefits of Facebook “friends”: Social capital and college students' use of online social network sites. *J. Comput. Mediat. Comm.* 12, 1143–1168.
- Elzinga, G., Liefbroer, A., 2007. Destandardization of life trajectories of young adults: A crossnational comparison using sequence analysis. *Eur. J. Popul.* 23, 225–250.
- Erikson, R., Goldthorpe, J.H., 1992. *The Constant Flux: A Study of Class Mobility in Industrial Societies*. Press Oxford, Clarendon.
- Eurostat, 2011. *Internet Use in Households and by Individuals in 2011*. Available from: <http://ec.europa.eu/eurostat/product?lang=en&mode=view&code=KS-SF-11-066> [accessed 08.01.16].
- Feld, S.L., 1984. The structured use of personal associates. *Soc. Forces* 62, 640–652.
- Feliciano, C., Robnett, B., Komaie, G., 2009. Gendered racial exclusion among white Internet daters. *Soc. Sci. Res.* 38, 39–54.
- Feliciano, C., Lee, R., Robnett, B., 2011. Racial boundaries among Latinos: Evidence from Internet daters' racial preferences. *Soc. Probl.* 58, 189–212.
- Finkel, E.J., Eastwick, P.W., Karney, B.R., Reis, H.T., Sprecher, S., 2012. Online dating: A critical analysis from the perspective of psychological science. *Psychol. Sci. Public Interest* 13, 3–66.
- Fiore, A.T., Donath, J.S., 2005. Homophily in online dating: When do you like someone like yourself? CHI '05 Ext. Abstr. Hum. Factors Computing Syst. 1371–1374.
- Friendly, M., 1994. Mosaic displays for multi-way contingency tables. *J. Am. Stat. Assoc.* 89, 190–200.
- Friendly, M., 2002. A brief history of the mosaic display. *J. Comput. Graph. Stat.* 11, 89–107.
- Fu, V.K., 2001. Racial intermarriage pairings. *Demography* 38, 147–159.
- Fu, X., Heaton, T.B., 2008. Racial and educational endogamy: 1980 to 2000. *Sociol. Perspect.* 51, 735–758.
- Gangl, M., Ziefle, A., 2009. Motherhood, labor force behavior, and women's careers: An empirical assessment of the wage penalty for motherhood in Britain, Germany, and the United States. *Demography* 46, 341–369.
- Golder, S.A., Macy, M.W., 2014. Digital footprints: Opportunities and challenges for online social research. *Annu. Rev. Sociol.* 40, 129–152.
- González-Ferrer, A., 2006. Who do immigrants marry? Partner choice among single immigrants in Germany. *Eur. Sociol. Rev.* 22 (2), 171–185.
- Grave, B.S., Schmidt, C.M., 2012. *The Dynamics of Assortative Mating in Germany*. <http://dx.doi.org/10.2139/ssrn.2122485>. Ruhr Economic Paper No. 346. Available at SSRN: <http://ssrn.com/abstract=2122485>.
- Hall, J.A., 2014. First comes social networking, then comes marriage? Characteristics of Americans married 2005–2012 who met through social networking sites. *Cyberpsychol. Behav. Soc. Netw.* 17, 322–326.
- Harknett, K., 2008. Mate availability and unmarried parent relationships. *Demography* 45, 555–571.
- Hendrickx, J., Schreuder, O., Ultee, W., 1994. Die konfessionelle mischehe in Deutschland (1901–1986) und den Niederlanden (1914–1986). *Köln. Z. Soziol. Sozialpsych.* 46 (4), 619–645.
- Henry-Waring, M., Barraket, J., 2008. Dating and intimacy in the 21st Century: The use of online dating sites in Australia. *Int. J. Emerg. Technol. Soc.* 6, 14–33.
- Heuveline, P., Timberlake, J.M., 2004. The role of cohabitation in family formation: The United States in comparative perspective. *J. Marriage Fam.* 66, 1214–1230.
- Hitsch, G.J., Hortaçsu, A., Ariely, D., 2010. Matching and sorting in online dating. *Am. Econ. Rev.* 100, 130–163.
- Hou, F., Myles, J., 2008. The changing role of education in the marriage market: Assortative marriage in Canada and the United States since the 1970s. *Can. J. Sociol.* 33, 337–366.
- Houston, S., Wright, R., Ellis, M., Holloway, S., Hudson, M., 2005. Places of possibility: Where mixed-race partners meet. *Prog. Hum. Geog.* 29, 700–717.
- Hout, M., 1983. *Mobility Tables*. Sage, Beverly Hills.
- Huinink, J., Brüderl, J., Nauck, B., Walper, S., Castiglioni, L., Feldhaus, M., 2011. Panel analysis of intimate relationships and family dynamics (pairfam): Conceptual framework and design. *Z. Fam.* 3 (1), 77–101.
- Hutnik, N., 1991. *Ethnic Minority Identity*. Clarendon Press, Oxford.
- Kalmijn, M., 1991. Status endogamy in the United States. *Am. J. Sociol.* 97, 496–523.
- Kalmijn, M., 1998. Intermarriage and homogamy: Causes, patterns, trends. *Annu. Rev. Sociol.* 24, 395–421.
- Kalmijn, M., 2005. Attitude alignment in marriage and cohabitation: The case of sex-role attitudes. *Pers. Relatsh.* 12, 521–535.
- Kalmijn, M., Flap, H., 2001. Assortative meeting and mating: Unintended consequences of organized settings for partner choices. *Soc. Forces* 79, 1289–1312.
- Kalmijn, M., Graaf, P.M., de Janssen, J.P.G., 2005. Intermarriage and the risk of divorce in the Netherlands: The effects of differences in religion and in nationality, 1974–94. *Pop. Stud.* 59, 71–85.
- Klein, T., Wunder, E., 1996. Regionale disparitäten und konfessionswechsel als ursache konfessioneller homogamie. *Köln. Z. Soziol. Sozialpsych.* 48, 96–125.
- Koopmans, R., Schaeffer, M., 2015. Relational diversity and neighbourhood cohesion. Unpacking variety, balance and in-group size. *Soc. Sci. Res.* 53, 162–176.

- Kreyenfeld, M., Walke, R., Salzburger, V., Schnor, C., Bastin, S., Kuhnt, A.-K., 2011. DemoDiff—Wave 1: Supplement to the Pairfam Data Manual. MPIDR Technical Report 2011-004. Max Planck Institute for Demographic Research, Rostock.
- Lampard, R., 2007. Couples' places of meeting in late 20th century Britain: Class, continuity and change. *Eur. Sociol. Rev.* 23, 357–371.
- Laumann, E.O., Gagnon, J.H., Michael, R.T., Michaels, S., 1994. *The Social Organization of Sexuality: Sexual Practices in the United States*. University of Chicago Press, Chicago.
- Lehrer, E.L., 1998. Religious intermarriage in the United States: Determinants and trends. *Soc. Sci. Res.* 27, 245–263.
- Lewis, K., 2013. The limits of racial prejudice. *P. Natl. Acad. Sci. U. S. A.* 110, 18814–18819.
- Lin, K.-H., Lundquist, J., 2013. Mate selection in cyberspace: The intersection of race, gender, and education. *Am. J. Sociol.* 119, 183–215.
- Liu, H., Lu, J., 2006. Measuring the degree of assortative mating. *Econ. Lett.* 92, 317–322.
- Lucassen, L., Laarman, C., 2009. Immigration, intermarriage and the changing face of Europe in the post war period. *Hist. Fam.* 14 (1), 52–68.
- Manning, W.D., Brown, S.L., Payne, K.K., 2014. Two decades of stability and change in age at first union formation. *J. Marriage Fam.* 76, 247–260.
- Mare, R.D., 1991. Five decades of educational assortative mating. *Am. Sociol. Rev.* 56, 15–32.
- Mare, R.D., 2000. Assortative Mating, Intergenerational Mobility, and Educational Inequality. Working Paper CCPR-004–00. California Center for Population Research, University of California—Los Angeles.
- Marsden, P.V., 1990. Network data and measurement. *Annu. Rev. Sociol.* 16, 435–463.
- McPherson, J.M., Smith-Lovin, L., 1987. Homophily in voluntary organizations: Status distance and the composition of face-to-face groups. *Am. Sociol. Rev.* 52, 370–379.
- McPherson, J.M., Smith-Lovin, L., Cook, J.M., 2001. Birds of a feather: Homophily in social networks. *Annu. Rev. Sociol.* 27, 415–444.
- Merkle, E.R., Richardson, R.A., 2000. Digital dating and virtual relating: Conceptualizing computer mediated romantic relationships. *Fam. Rel.* 49 (2), 187–192.
- Merton, R.K., 1941. Intermarriage and the social structure: Fact and theory. *Psychiatry* 4, 361–374.
- Milewski, N., Kulu, H., 2013. Mixed marriages in Germany: A high risk of divorce for immigrant-native couples. *Eur. J. Popul.* 30, 89–113.
- Mollenhorst, G.W., Völker, B., Flap, H., 2008a. Social contexts and personal relationships: The effect of meeting opportunities on similarity for personal relationships of different strength. *Soc. Netw.* 30, 60–68.
- Mollenhorst, G.W., Völker, B., Flap, H., 2008b. Social contexts and core discussion networks: Using a choice constraint approach to study similarity in intimate personal relationships. *Soc. Forces* 86, 937–965.
- Potarca, G., Mills, M., 2015. Racial preferences in online dating across European countries. *Eur. Sociol. Rev.* 31, 326–341.
- Qian, Z., Preston, S.H., 1993. Changes in American marriage, 1972 to 1987: Availability and forces of attraction by age and education. *Am. Sociol. Rev.* 58, 482–495.
- Raftery, A.E., 1986. Choosing models for cross-classifications. *Am. Sociol. Rev.* 51, 145–146.
- Raymo, J.M., Xie, Y., 2000. Temporal and regional variation in the strength of educational endogamy. *Am. Sociol. Rev.* 65, 773–781.
- Robnett, B., Feliciano, C., 2011. Patterns of racial-ethnic exclusion by internet daters. *Soc. Forces* 89, 807–828.
- Rosenfeld, M.J., 2008. Racial, educational and religious endogamy in the United States: A comparative historical perspective. *Soc. Forces* 87, 1–31.
- Rosenfeld, M.J., Thomas, R.J., 2012. Searching for a mate: The rise of the Internet as a social intermediary. *Am. Sociol. Rev.* 77, 523–547.
- Rosenfeld, M.J., Thomas, R.J., Falcon, M., 2011. How Couples Meet and Stay Together, Waves 1, 2, and 3: Public Version 3.04 [Computer file]. Stanford University Libraries, Stanford, CA.
- Schroedter, J.H., 2006. Binationale ehen in Deutschland. *Wirtsch. Stat.* 4, 419–431.
- Schulz, F., Skopek, J., Klein, D., Schmitz, A., 2008. Wer nutzt Internetkontaktbörsen in Deutschland? *Z. Fam.* 20, 271–292.
- Schwartz, C.R., 2013. Trends and variation in assortative mating: Causes and consequences. *Annu. Rev. Sociol.* 39, 451–470.
- Schwartz, C.R., Mare, R.D., 2005. Trends in educational assortative marriage from 1940 to 2003. *Demography* 42, 621–646.
- Shafer, K., 2013. Unique matching patterns in remarriage: Educational assortative mating among divorced men and women. *J. Fam. Issues* 34 (11), 1500–1535.
- Sherkat, D.E., 2004. Religious intermarriage in the United States: Trends, patterns, and predictors. *Soc. Sci. Res.* 33, 606–625.
- Skopek, J., Schulz, F., Blossfeld, H.-P., 2011. Who contacts whom? Educational homophily in online mate selection. *Eur. Sociol. Rev.* 27, 180–195.
- Smith, A., Duggan, M., 2013. *Online Dating & Relationships*. Pew Internet and American Life Project, Washington, DC. Retrieved November 25, 2013. http://www.pewinternet.org/files/old-media/Files/Reports/2013/PIP_Online20Dating202013.pdf.
- Smits, J., Ultee, W.C., Lammers, J., 1998. Educational endogamy in 65 countries: An explanation of differences in openness using country-level explanatory variables. *Am. Sociol. Rev.* 63, 264–285.
- Sobotka, T., Toulemon, L., 2008. Overview chapter 4: Changing family and partnership behaviour: Common trends and persistent diversity across Europe. *Demogr. Res.* 19, 85–138.
- Soehl, T., Yahirun, J., 2011. Timing of union formation and partner choice in immigrant societies: The United States and Germany. *Adv. Life Course Res.* 16, 205–216.
- Sprecher, S., 2009. Relationship initiation and formation on the Internet. *Marriage Fam. Rev.* 45, 761–782.
- Stauder, J., 2014. Friendship networks and the social structure of opportunities for contact and interaction. *Soc. Sci. Res.* 48, 234–250.
- Sumner, W.G., 1906. *Folkways*. Ginn, Boston.
- Tajfel, H., 1982. *Social Identity and Intergroup Relations*. Cambridge University Press, Cambridge.
- Todd, E., 1994. *Le destin des immigrés: Assimilation et ségrégation dans les démocraties occidentales*. Seuil, Paris.
- Tsunokai, G.T., McGrath, A.R., Kavanagh, J.K., 2014. Online dating preferences of Asian Americans. *J. Soc. Pers. Relat.* 31 (6), 796–814.
- Tufekci, Z., Brashears, M.E., 2014. Are we all equally at home socializing online? Cybersociality and evidence for an unequal distribution of disdain for digitally-mediated sociality. *Inf. Commun. Soc.* 17, 486–502.
- Weakliem, D., 1999. A critique of the Bayesian information criterion for model selection. *Sociol. Methods Res.* 27, 359–397.
- Wilson, S.B., McIntosh, W.D., Insana, S.P., 2007. Dating across race: An examination of African American internet personal advertisements. *J. Black Stud.* 37, 964–982.
- Xie, Y., 1992. The log-multiplicative layer effect model for comparing mobility tables. *Am. Sociol. Rev.* 57, 380–395.
- Yancey, G., 2007. Homogamy over the net: Using Internet advertisement to discover who interracially dates. *J. Soc. Pers. Relat.* 24, 913–930.
- Yancey, G., 2009. Crossracial differences in the racial preferences of potential dating partners: A test of the alienation of African Americans and social dominance orientation. *Sociol. Quart.* 50, 121–143.
- Zeileis, A., Meyer, D., Hornik, K., 2007. Residual-based shadings for visualizing (conditional) independence. *J. Comput. Graph. Stat.* 16, 507–525.
- Zhou, X., 2015. Shrinkage estimation of log-odds ratios for comparing mobility tables. *Sociol. Methodol.* 45, 320–356.